



FIG. 1.—The Accused Men

MEDICAL EXPERIMENTS ON HUMAN BEINGS IN CONCENTRATION CAMPS IN NAZI GERMANY

BY

KENNETH MELLANBY, O.B.E., Sc.D.

Reader in Medical Entomology, London School of Hygiene and Tropical Medicine

The present trials of many German doctors and medical administrators before Military Tribunal I of the United States of America at Nuremberg has drawn public attention to the vast number of human experiments, many of which proved fatal to the victims, which were carried out on prisoners in concentration camps. This trial is not yet over, and many more trials of a similar nature are likely to take place in the near future; it would therefore be improper at this time to discuss in any detail the personal responsibility or guilt of any of the defendants, since the matter is still *sub judice*. However, many points have already been clearly established, and a picture of the organization and conditions which made these actions possible can be given.

Some people in this country have suggested that the accounts which they have read of these experiments, and of conditions in concentration camps generally, have been wilfully distorted as propaganda in order to intensify hatred against Germany. It has even been suggested that few or even no experiments of an objectionable nature ever took place. The fact of the experiments was clearly proved by the International Military Tribunal which tried Goering and his colleagues. The judgment of the I.M.T. states:

"The inmates [of concentration camps] were subjected to cruel experiments; victims were immersed in cold water until their body temperature was reduced to 28° C., when they died immediately. Other experiments included high-altitude experiments in pressure chambers, experiments to determine how long human beings could survive in freezing water, experiments with poison bullets, experiments with contagious diseases, and experiments dealing with sterilization of men and women by x rays and other methods." There are many references to these and other experiments in the judgment, and to the responsibility of the various Nazi leaders and organizations. There is no doubt that thousands of individuals were the involuntary victims of medical experiments and that a high proportion died. Many more died as a result of medical neglect or improper treatment. Finally, thousands of prisoners were put to death by methods

devised and executed by physicians engaged in "research" into the problem of killing as rapidly and expeditiously as possible.

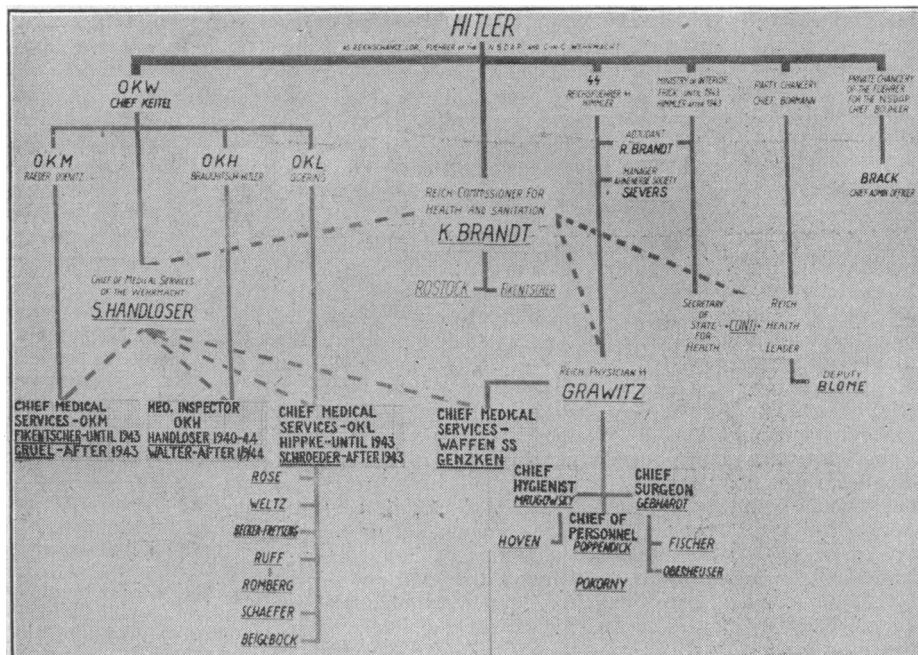
The Punishment of War Crimes

Before the end of the war the Allies resolved that after victory those members of the Axis Powers who had been guilty of war crimes should be made to pay the penalty, and they established an elaborate mechanism to ensure this. In Germany the International Military Tribunal, representing Britain, France, Russia, and the United States, was set up to try the

leaders of Nazi Germany who were deemed to have the major responsibility for the crimes which caused the war and which accompanied hostilities. While this tribunal was still sitting each of the four occupying powers set up its own military tribunals to try the "lesser fry." Long before the I.M.T. had reached its decision the other tribunals had completed numerous cases, acquitting some defendants, convicting others and sentencing them to death or imprisonment. It is intended that a uniform standard of justice should be maintained by all powers.

Defendants have already been convicted and executed for carrying out medical experiments. Thus at Dachau early in 1946 Dr. Klaus Karl Schilling, the eminent malariologist, was hanged for his part in experiments in which some 1,200 prisoners were infected with malaria. He had a greater claim than most of the experimenters to the title of scientist. He went to Dachau on the invitation of Himmler to carry out experiments in malaria, on which subject he was a well-known authority (he had been a member of the League of Nations Malaria Commission). He was over 70 when these experiments were carried out. Believing that the experiments would provide an unequalled opportunity for the advancement of malariaology he used a mild strain of benign tertian malaria which would be unlikely to prove fatal in healthy individuals, and he himself appears always to have administered drugs carefully and scientifically. He is said usually to have obtained the consent of the prisoners before he infected them, but at Dachau this could not amount to very much. He was accused at a trial held by the U.S. authorities of having caused many deaths. The Court took the view that "although Dr. Schilling's motive may have been sincere and purely a scientific one, his activities exemplified the 'Nazi' schema which existed at Dachau. The

FIG. 2.—Chain of Responsibility



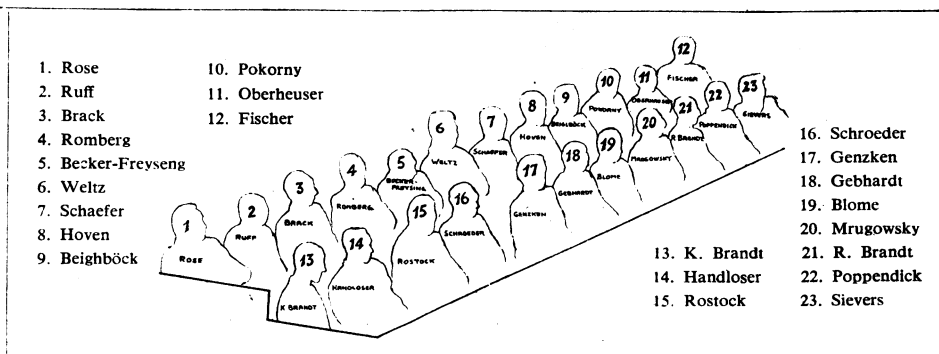
part he played in that schema is clear." Quite a number of other medical research workers, some of whose names have been mentioned in evidence at the present Nuremberg trial, are under detention awaiting examination before American, British, French, or Russian tribunals. It is a pity that the existence of these other tribunals is so little known. They are doing a difficult and thankless job, often revealing facts of great interest and importance about medical experiments and other activities.

It is a little difficult to give briefly a clear statement of the legal basis on which these various tribunals operate, and some eminent jurists feel that the situation is unsatisfactory and may lead to serious abuses. The tribunals do not work strictly according to the legal code of any country. They follow the laws as set forth by the Allied Control Council in 1945, and they attempt also to abide by decisions and resolutions of various international conventions, such as that signed at The Hague in 1907. The laws of evidence are as a rule rather liberally interpreted, and as a result much time is spent in wrangling between the opposing counsel as to the admissibility or otherwise of affidavits and other documents. My own impression is that the various tribunals do in fact preserve a proper judicial impartiality and make every effort to give all the defendants a just hearing.

The Indictment

The twenty-three defendants at present on trial at Nuremberg are all charged on three specific counts, and ten of them face a fourth charge. The charges are as follows: I. The common design or conspiracy. II War Crimes. III. Crimes against humanity. IV. Membership of a criminal organization (this applies to the ten members of the S.S.).

To the non-legal mind the first three charges are very confusing, for they all refer to various aspects of the same activities. It is under Charge II, War crimes, that the various medical experiments are given in detail and the particular responsibilities of the different defendants are listed. The experiments, which will be dealt with in more detail in a later article, concern toleration of high altitudes, resistance to freezing, malaria infection, mustard gas, treatment with sulphonamides and other substances of artificially inflicted wounds, the regeneration of tissues in artificially inflicted wounds, the potability of sea water, epidemic jaundice, methods of sterilization, epidemic typhus, effects of poison, the treatment of burns by incendiary bombs. Further crimes consist of the murder of 112 Jews to



Key to Fig. 1.

produce a skeleton collection, and the various "euthanasia" programmes for removing scores of thousands of Poles with tuberculosis and millions of "useless eaters."

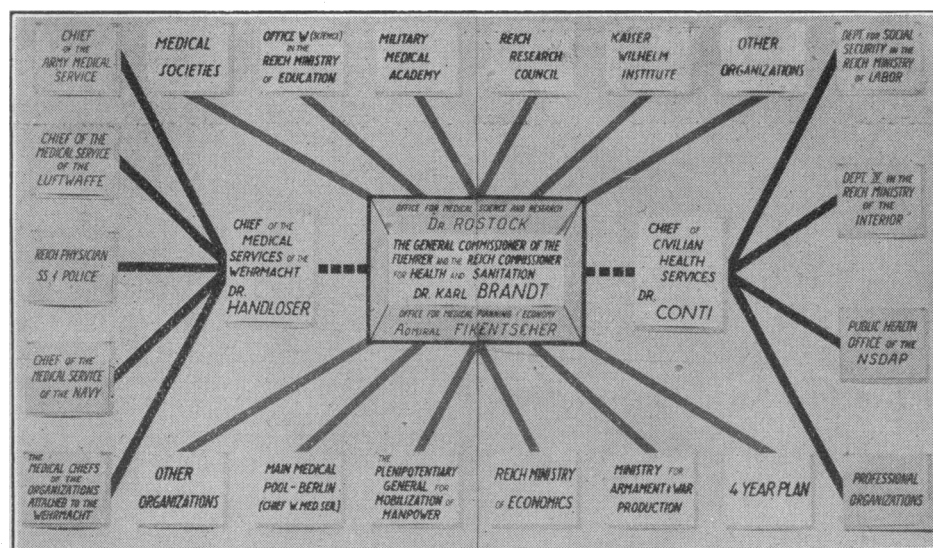
Brigadier-General Telford Taylor, of the U.S. Army, chief counsel for the prosecution, made the various issues clear in his opening speech. He stated that "the defendants are charged with murders, tortures, and other atrocities committed in the name of medical science. The victims of these crimes are numbered in hundreds of thousands." He then stated that the prosecution did not merely wish to punish the guilty for their part in these atrocities, but that "it is far more important that these incredible events be established by clear and public proof, so that no one can ever doubt that they were fact and not fable, and that this court, as the agent of the United States and as the voice of humanity, stamp the ideas which engendered them as barbarous and criminal." The essential point was to show how "the poison of Nazi doctrine" had so corrupted men "exceptionally qualified to form a moral and professional judgment" that they were capable of these acts. It was necessary to demonstrate clearly that it was not a few sadistic criminals who were responsible but that the whole body of organized medicine in Nazi Germany was behind the policy.

The Defendants

There are at present twenty-three defendants in the dock at Nuremberg (see photograph on p. 148). Of these, twenty are medical men of one kind or another, and three were concerned with lay administration. These defendants are, however, by no means the only Germans who might have been indicted. The I.M.T. made it clear that these medical crimes were part of the general policy of the Nazi leaders. Hitler knew about them, and gave his approval and encouragement. But of the better-known leaders it is Heinrich Himmler, *Reichsführer* of the S.S. and later also Minister of the Interior, who was particularly concerned. Himmler eluded the gallows by committing suicide, but his obsessional character made him retain every letter, memorandum, and report, even including scraps of paper with rough notes on them. These documents clearly established his paramount role. He was not himself a scientist, but he took a considerable, though quite uninformed, interest in research. In medical investigations he was constantly urging others on to produce immediate practical results irrespective of the brutalities which might be inflicted. This constant urging from above that "practical" results must be forthcoming, together with the general unscientific temper of the environment, did much to ensure that the experiments were of the minimum scientific value.

Few of the defendants are accused of actually carrying out the experiments themselves; they are mostly the responsible organizers alleged to have planned the

FIG. 3.—Karl Brandt's Web



investigations. Listening in court one sometimes felt that the prosecution was equally aimed at people who were absent. Thus a Dr. Rascher, who, it appears, was finally shot at Himmler's own order, was concerned with the more revolting experiments on cold and high altitude. The typhus work was carried out by Dr. Ding, who committed suicide after his capture. A Prof. Hirt, of Strasbourg, who has so far avoided capture, was concerned in the Jewish skeleton collection and the poison-gas experiments.

Fig. 2, which is based on a diagram produced by the prosecution, shows the relative positions of the various defendants in the Nazi medical hierarchy. To complete the picture various "absent defendants" are included. The diagram illustrates the curious double pattern of control so characteristic of the regime. The head of every medical department will be seen to be responsible to his own lay chief and also to a medical *fürher* who is independent of the administrative head of the department but is himself responsible to some higher authority. The authority of Hitler will be seen to pass down through several channels which divide and then become knit together again in an intricate and all-pervading pattern.

Hitler himself had three main functions—*Reichskanzler*, leader of the Nazi party, and Commander-in-Chief of the *Wehrmacht*. He was therefore the complete dictator, with overall control of every activity in the country. Under him there were the various departmental heads—Keitel over the armed forces, Himmler as *Reichsführer S.S.* and Minister of the Interior, and others less concerned with this trial.

In German medicine the defendant Karl Brandt occupied the paramount position. At the age of 38 he was appointed *Reichskommissar* for Health and Sanitation, directly responsible to Hitler alone. He had direct and complete control over every medical activity (see Fig. 3), and could deal with any department without reference to the administrative head. The defendant Rostock worked directly under him and was responsible for the control of medical research.

The two main branches of the medical services were: (a) those of the armed forces under Handloser, responsible to Keitel on the one hand and to Karl Brandt on the other, and (b) the civilian services under Conti (who committed suicide), responsible to the Minister of the Interior and again to the ubiquitous Brandt. In addition the S.S., which formed virtually a privileged state of its own, had a separate medical service under Grawitz, another "absent defendant," but he again was subject to Karl Brandt's supervision. The navy, army, and air force each had its own medical service, and the chief officer of each was responsible to his own C-in-C. as well as to Handloser, who combined his function of chief of the medical services of the *Wehrmacht* with his supervisory capacity over the medical service of the *Waffen S.S.* (the armed part of the S.S., which eventually had some thirty divisions in the field).

"Thanatology"

The prosecution has used the word "thanatology," which they define as "the science of producing death," to describe the experiments. They allege that the object of the majority of the experimenters was not to advance medical science but to produce methods of speedy extermination. This seems to be true of some investigations, in which intravenous injections of phenol and other substances produced death in a few seconds. The work on the effects of poison gas would seem to have been so mixed with the programme of extermination of Jews and others deemed "undesirable" that it is difficult to distinguish experimentation from wholesale killing.

The prosecution has further urged that practically no results of any value were obtained in any of the work. This is a point which needs further study. From what we already know of the typhus work it is clear that a useful evaluation of the various vaccines was obtained; some of these results have already been published.¹ Preliminary studies suggest that the other work may not advance medical science a great deal, for two reasons: first, some of the results, particularly those obtained by workers like Rascher, are so inaccurate that they cannot be relied on; secondly, few of the original records are available, because they were destroyed to prevent their capture by the Allies in order to try to conceal the fact that the experiments took place.

¹ Ding, E. (1943). *Z. Hyg. InfektKr.*, **124**, 670.

Generally speaking there is no doubt that most of the work was badly planned and carried out under conditions where scientific thinking was difficult. The S.S. was responsible for supplying the human subjects, and Himmler was only interested in quick practical results. This constant political pressure must have had a bad effect. Then the victims of the experiments were not the willing co-operators who have taken part as volunteers in so many experiments in this country, in Australia, and in America. They were prisoners, compelled to take part in work which they knew would quite probably mean their death, and if sabotage was possible they looked upon it as their duty.

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ANAESTHETIC APPARATUS

NEW SAFETY CODE

The Medical Defence Union has records of many of the fatal accidents that have followed the administration of anaesthetic gases. Recently the Union arranged a conference of interested parties in an attempt to minimize human errors in the use and assembly of anaesthetic apparatus. Ultimately a committee was set up consisting of representatives of the Medical Defence Union, the Association of Anaesthetists, and the manufacturers of anaesthetic apparatus and gases. This committee has put forward a short-term policy which can be effected immediately and which includes proposals for the distinctive marking of cylinders and pipes, for planned storage, and for the selection and instruction of personnel. Its long-term policy calls for a complete system of non-interchangeable connexions for gas apparatus. This will make wrongful coupling impossible, but can be fully achieved only by the introduction and universal use of a new type of cylinder valve, with consequent changes of the apparatus attached to the cylinders. Until such time as this "fool-proofing" can be brought about the risk of a wrong connexion must remain, but a code of practice has now been formulated which should reduce this risk to a minimum.

A British Standard Code of Practice (B.S. 1319:1946, price 2s. net) has been prepared under the authority of the Chemical Engineering Divisional Council in response to the joint representations of the Medical Defence Union and the Association of Anaesthetists. The code relates to gases contained in cylinders for use in anaesthesia, oxygen therapy, and for other medical purposes; to certain features of anaesthetic and gas therapy apparatus; and to gas distribution systems by pipelines in hospitals. The suggested colour scheme for cylinder identification is as follows:

Table of Identification Colours for Medical Gas Cylinders

Name of Gas	Symbol	Colour of Cylinder Body	Colour of Shoulder, where Different from Body
Carbon dioxide for inhalation	CO ₂	Upper $\frac{1}{2}$ Sea green (B.S. Colour No. 17) Lower $\frac{1}{2}$ Black	—
Carbon dioxide with internal tube (for making snow)	CO ₂	Sea green (B.S. Colour No. 17)	—
Cyclopropane ..	C ₃ H ₆	Aluminium	Red (B.S. Colour No. 37)
Ethylene ..	C ₂ H ₄	Mauve	Red (B.S. Colour No. 37)
Helium ..	He	Brown (B.S. Colour No. 11)	—
Helium and oxygen mixture	He+O ₂	Brown (B.S. Colour No. 11)	White
Nitrous oxide ..	N ₂ O	Black	—
Oxygen ..	O ₂	Black	White
Oxygen and carbon dioxide mixture	O ₂ +CO ₂	Black	Sea green (B.S. Colour No. 17) with white neck

The figures in brackets are references to the colours established in British Standard 381—British Standard Colours for Ready-mixed Paints.

It is also recommended that no cylinder should be encased in any covering; that the label encircling a gas cylinder should be printed in characteristic colours with the name of the gas